

CLAIMS

We claim:

- 1 1. A system comprising:
2 a memory sized to include lines to store a band of an image and
3 additional lines;
4 a wavelet processing logic comprising
5 a wavelet transform to generate coefficients when applied to
6 data in the memory;
7 access logic to read data from the memory into the line buffers
8 to supply data stored in the memory to the wavelet transform and to store
9 coefficients in the memory, such that after data stored at a first pair of lines
10 is read from memory into the buffers of the access logic, the access logic
11 reuses the first pair of lines to store coefficients generated by the wavelet
12 transform that are associated with a second pair of lines different from the
13 first pair of lines.

[illegible]
$$3 \quad 2^{(\text{transform level of coefficient being stored})}$$

1 7. The system defined in Claim 6 wherein, during decomposition,
2 the offset for storing the first rows of each pair of rows of L1 coefficients in
3 the memory is two lines from the first row of data of the image associated
4 with said each pair of rows of the L1 coefficients, and the offset for storing
5 the first row of each pair of rows of L2 coefficients is four lines from the first
6 row of L1 coefficients associated with said each pair of rows of the L2
7 coefficients.

1 8. The system defined in Claim 1 wherein the access logic stores
2 coefficients associated with a decomposition level greater than level three in
3 the lines of the memory that previously stored the band of the image.

1 9. The system defined in Claim 3 wherein the addition lines
2 relating to the offset are above the line storing the band of the image.

1 10. The system defined in Claim 1 wherein the wavelet transform
2 is a forward wavelet transform.

1 11. The system defined in Claim 1 wherein the wavelet transform
2 is an inverse wavelet transform.

1 12. A method comprising:
2 reading data from a memory into line buffers to apply a wavelet
3 transform thereto; and
4 storing coefficients created by applying the wavelet transform at lines
5 in the memory so that each set of coefficients generated from data stored at
6 each pair of lines in the memory is stored in the memory at lines that are at
7 an offset with request to said each pair of lines in the memory.

1 13. The method defined in Claim 12 further comprising access
2 logic reusing a first pair of lines to store coefficients generated by a wavelet
3 transform, that are associated with a second pair of lines different from the
4 first pair of lines, after data stored at a first pair of lines is read from memory
5 into the buffers of the access logic, and wherein a first line of each of the first
6 and second pairs of lines are located in the memory at an offset with respect
7 to each other.

1 14. The method defined in Claim 13 further comprising the access
2 logic storing the first outputs of the wavelet transform for each coefficient
3 level in additional lines within a distance of the offset.

1 15. The method defined in Claim 13 wherein size of the offset is
2 different for each transform level.

1 16. The method defined in Claim 13 wherein the size of the offset
2 is equal to:
3 $2^{(\text{transform level of coefficient being stored})}$

1 17. The method defined in Claim 16 wherein, during
2 decomposition, the offset for storing the first rows of each pair of rows of L1
3 coefficients in the memory is two lines from the first row of data of the
4 image associated with said each pair of rows of the L1 coefficients, and the
5 offset for storing the first row of each pair of rows of L2 coefficients is four
6 lines from the first row of L1 coefficients associated with said each pair of
7 rows of the L2 coefficients.

1 18. The method defined in Claim 12 further comprising access
2 logic storing coefficients associated with a decomposition level greater than
3 level three in the lines of the memory that previously stored the band of the
4 image.

1 19. The method defined in Claim 13 wherein the addition lines
2 relating to the offset are above the line storing the band of the image.

1 20. An article of manufacture comprising at least one recordable
2 media storing executable instructions thereon which, when executed by a
3 processing device, cause the processing device to:

4 read data from a memory into line buffers to apply a wavelet
5 transform thereto; and

6 store coefficients created by applying the wavelet transform at lines in
7 the memory so that each set of coefficients generated from data stored at
8 each pair of lines in the memory is stored in the memory at lines that are at
9 an offset with request to said each pair of lines in the memory.

1 21. The article of manufacture defined in Claim 20 further
2 comprising instructions, which when executed by the processing device
3 cause the processing device to reuse a first pair of lines to store coefficients
4 generated by a wavelet transform, that are associated with a second pair of
5 lines different from the first pair of lines, after data stored at a first pair of
6 lines is read from memory into the buffers of the access logic, and wherein a
7 first line of each of the first and second pairs of lines are located in the
8 memory at an offset with respect to each other.

1 22. An apparatus comprising:
2 means for reading data from a memory into line buffers to apply a
3 wavelet transform thereto; and
4 means for storing coefficients created by applying the wavelet
5 transform at lines in the memory so that each set of coefficients generated
6 from data stored at each pair of lines in the memory is stored in the memory
7 at lines that are at an offset with request to said each pair of lines in the
8 memory.

Sub
21